

ABSTRACT OF THE DISCLOSURE

AN OBJECT OF THE PRESENT INVENTION IS TO REALIZE AN ECONOMICAL OPTICAL TRANSMITTER-RECEIVER HAVING A SIMPLE STRUCTURE, WHICH IS SUITABLE FOR A HIGH-SPEED OPTICAL COMMUNICATION SYSTEM. IN ADDITION, ANOTHER OBJECT OF THE PRESENT INVENTION IS TO ACHIEVE IMPROVEMENT IN OPERATION SPEED OF A TRAVELING-WAVE ELEMENT, WHICH USES A COMPOUND SEMICONDUCTOR IN PARTICULAR, USING AN EASY TECHNIQUE. IN THE PRESENT INVENTION, A HIGH-FREQUENCY ELECTRIC LINE ON A MOUNTING SUBSTRATE BECOMES A TRAVELING-WAVE ELECTRODE OF A SEMICONDUCTOR OPTICAL ELEMENT EQUIVALENTLY BY THE FOLLOWING STEPS: SEPARATELY MANUFACTURING THE MOUNTING SUBSTRATE HAVING THE HIGH-FREQUENCY ELECTRIC LINE, AND THE SEMICONDUCTOR OPTICAL ELEMENT FOR WHICH HIGH-FREQUENCY DESIGN HAS BEEN APPLIED BEFOREHAND; AND THEN BONDING AND MOUNTING (THAT IS TO SAY, JUNCTION DOWN MOUNTING) OF DRIVE ELECTRODES OF THE MOUNTING SUBSTRATE AND THE SEMICONDUCTOR OPTICAL ELEMENT THROUGH A SOLDERING MATERIAL. IN ADDITION, IT IS ALSO POSSIBLE TO HAVE A CONFIGURATION IN WHICH NOT ONLY JUNCTION DOWN MOUNTING OF HIGH-FREQUENCY SEMICONDUCTOR OPTICAL ELEMENTS, BUT ALSO THAT OF AN ELECTRONIC ELEMENT FOR ELECTRICALLY DRIVING AND CONTROLLING A LIGHT SOURCE SUCH AS A SEMICONDUCTOR LASER AND FOR ELECTRICALLY DRIVING AND CONTROLLING A HIGH-FREQUENCY SEMICONDUCTOR OPTICAL ELEMENT, IS PERFORMED ON THE MOUNTING SUBSTRATE DESCRIBED ABOVE.